Contribution ID: **1250** Type: **not specified**

P3.203 Mechanical properties and microstructure of W/CuY and W/CuCrZr composites produced by hot isostatic pressing

Wednesday, 19 September 2018 11:00 (2 hours)

It has been paid a great attention to the production of Tungsten/Copper (W/Cu) composites, as they appear promising materials to form part of the cooling system of the divertor of the future fusion reactors. However, further assessments of the microstructure and mechanical characteristics of these composites are required for the designs of the divertor. In this study, the mechanical behavior and the microstructure of W-15wt%CuY and W-15wt%CuCrZr have been investigated in compression from room temperature up to 500 ºC at initial strain rate of 10-4 s-1. Both materials have been produced by mixing W powder and CuY and CuCrZr pre-alloyed powders followed by degassing and sintering hot isostatic pressing (HIP). Fully dense composites were obtained showing homogeneous distribution of pre-alloyed CuY and CuCrZr phase particles embedded in W phase. The yield strength for W/15 wt%CuY decreased with temperature from 620 to 360 MPa, while W/15 wt%CuCrZr exhibited a much less pronounced yield strength reduction in the same temperature range, i.e. from 400 to 320 MPa. The deformed microstructure at low (250 ºC) and high temperature (500 ºC) was characterized in the light of electron backscatter diffraction (EBSD) measurements and nanoindentation mapping. The correlation between the plastic deformation, grain structure and the orientation relationships in the composites has been revealed.

Presenter: MUÑOZ, Angel (F'sica Aplicada Universidad Carlos III de Madrid)

Session Classification: P3